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UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service

ANALYSIS OF DATA RELATIVE TO THE MATURITY OF FLORIDA EARLY AND MID-
SEASON COMMON SWEET ORANGES, SEASONS 1938, 1939, and 1940

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Introduction

Data on solids, acidity, and volume of juice of Florida oranges were obtained during the seasons of 1938, 1939, and 1940, under practical commercial operations. These data appear to agree with those from experimental studies 2/ and to substantiate the general expert opinions regarding the behavior of internal characteristics of oranges.

This study is based upon an analysis of official inspection certificates issued in accordance with regulations covering the enforcement of the maturity laws of the State of Florida. These certificates covered more than 10,000,000 boxes of oranges and were issued during periods from October 8 to December 30 of the years 1938 and 1939, and from October 8 to December 2 in 1940.

Percentages given in figures 1 to 8 and in tables 1 to 6 for 1938 and 1940 were based upon the actual number of boxes of fruit covered by certificates, whereas the percentages for 1939 were ascertained from a cross section of representative tests made throughout the season in various districts and packing houses.

Figures and tables have been arranged to show progressive changes in average percentages of solids, acidity, and juice content, by weeks, throughout the maturity inspection period (October through December). Percentages are based upon State averages of composite tests and indicate the quantity of oranges that met various minimum requirements when tests were made.

Because of the impracticability of distinguishing between varieties, the data for all lots of the common sweet oranges were averaged.

The "A" specification referred to in this report (pages 18 and 19) is based upon a study of Dr. Paul L. Harding's work and was drawn up to provide for pleasantly tart and sweeter oranges. As used in this report it does not include requirements for volume of juice. A study of table 3 indicates that a minimum juice requirement of 4.5 gallons of juice per standard box would not appreciably affect the amount of fruit meeting the "A" specification.

1/ Acknowledgment is made to the Surplus Marketing Administration for certain data for 1939, and to the Florida Citrus Inspection Bureau for clerical assistance.

2/ "Seasonal Changes in Florida Oranges," by Dr. Paul L. Harding, U. S. D. A. Technical Bulletin No. 753. See also "Relation of Size of Fruit to Solids, Acid and Volume of Juice in the Principal Varieties of Florida Oranges," by Dr. Paul L. Harding and William E. Lewis. (A paper presented before the Florida State Horticultural Society, Orlando, Fla., April 17, 1941).

A study of data herein presented indicates the percentages of fruit that might reasonably be expected to meet the "A" specification. The data also can be used to indicate the probable effect of other specifications, such as different percentages of solids and acids, and they can be used in the determination of a requirement for volume of juice. Consideration, however, should be given to the fact that the data presented here are based upon averages of composite tests and not upon tests of individual oranges. Any requirements based upon tests of individual oranges would cause a slight reduction in the indicated quantity of fruit that would have met the various specifications shown in the accompanying figures and tables.

It is believed that these data, together with the results of published studies, should be of material aid in establishing practical standards for internal quality of oranges.

Total Soluble Solids

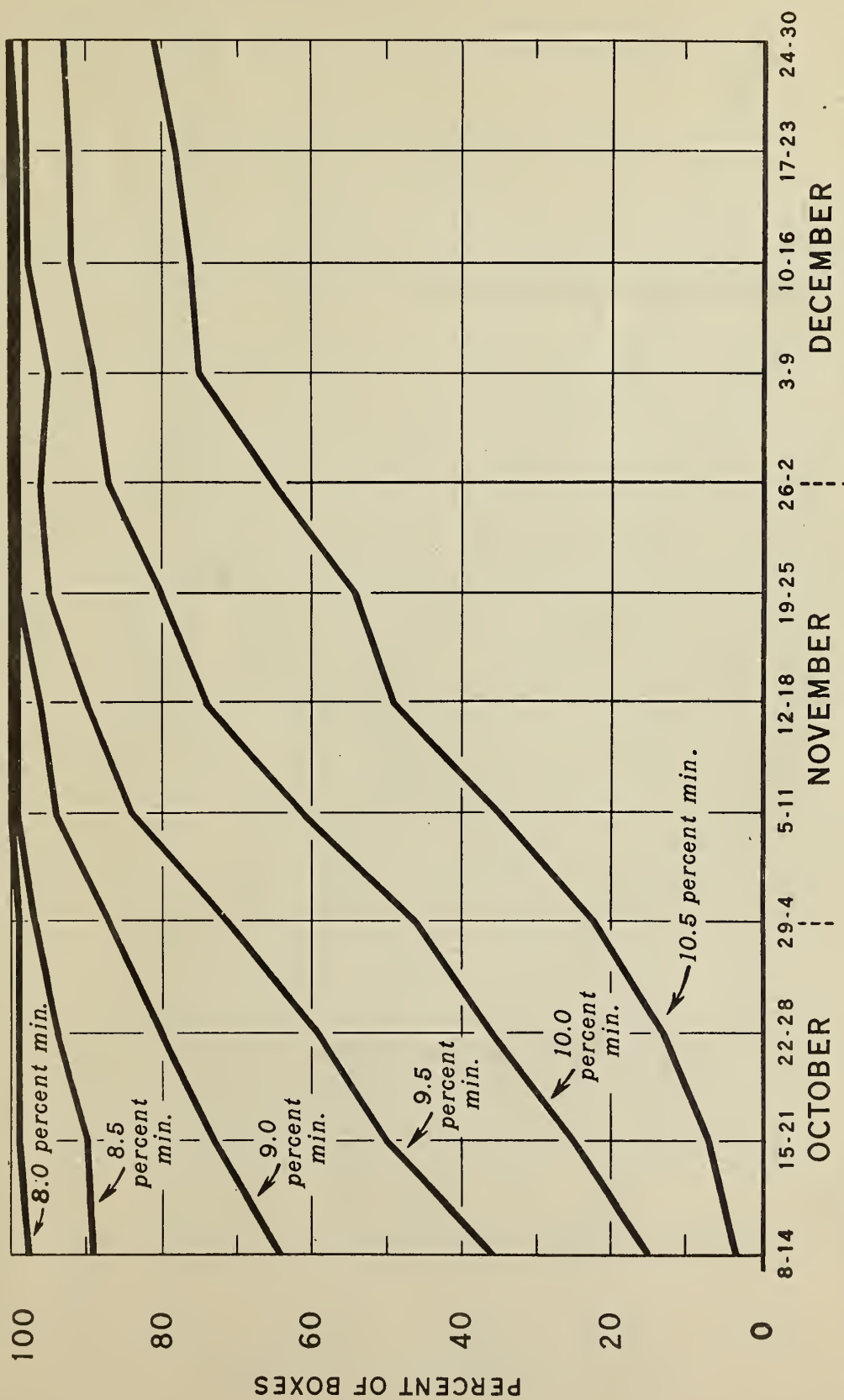
Figures 1, 2, and 3 show the percentages of oranges that met various minimum specifications for total soluble solids during weekly periods in each of the maturity inspection seasons of 1938, 1939, and 1940. The percentages also are shown in table 1 on page 7.

It will be noted that as the season progressed the solids increased. At the end of December, 81 percent of the oranges inspected contained at least 10.5 percent solids. Unquestionably much higher solids would have been found during the movement of Valencia oranges later in the season.

In 1938, (fig. 1) during the week of October 8 to 14, 98 percent of the movement of oranges met a minimum specification of 8 percent solids; during the period from October 15 to October 28, 99 percent of the fruit contained not less than 8 percent solids; and from October 29 to December 30, 100 percent met an 8 percent minimum of solids. During the week of November 5 to 11, 99 percent of the oranges met a minimum specification of 8.5 percent solids; 94 percent met a 9 percent minimum; 84 percent met a 9.5 percent minimum; 61 percent met a 10 percent minimum; and 35 percent met a 10.5 percent minimum of total soluble solids.

In 1939, (fig. 2) solids were very much lower at the beginning of the season than in either 1938 or 1940 but increased rapidly as the season progressed. During the period of November 12 to 18, 82 percent of the movement met a 9 percent minimum content of solids. This figure compares with 96 percent and 98 percent of the movement that met a 9 percent minimum during the same weekly periods in 1938 and 1940, respectively.

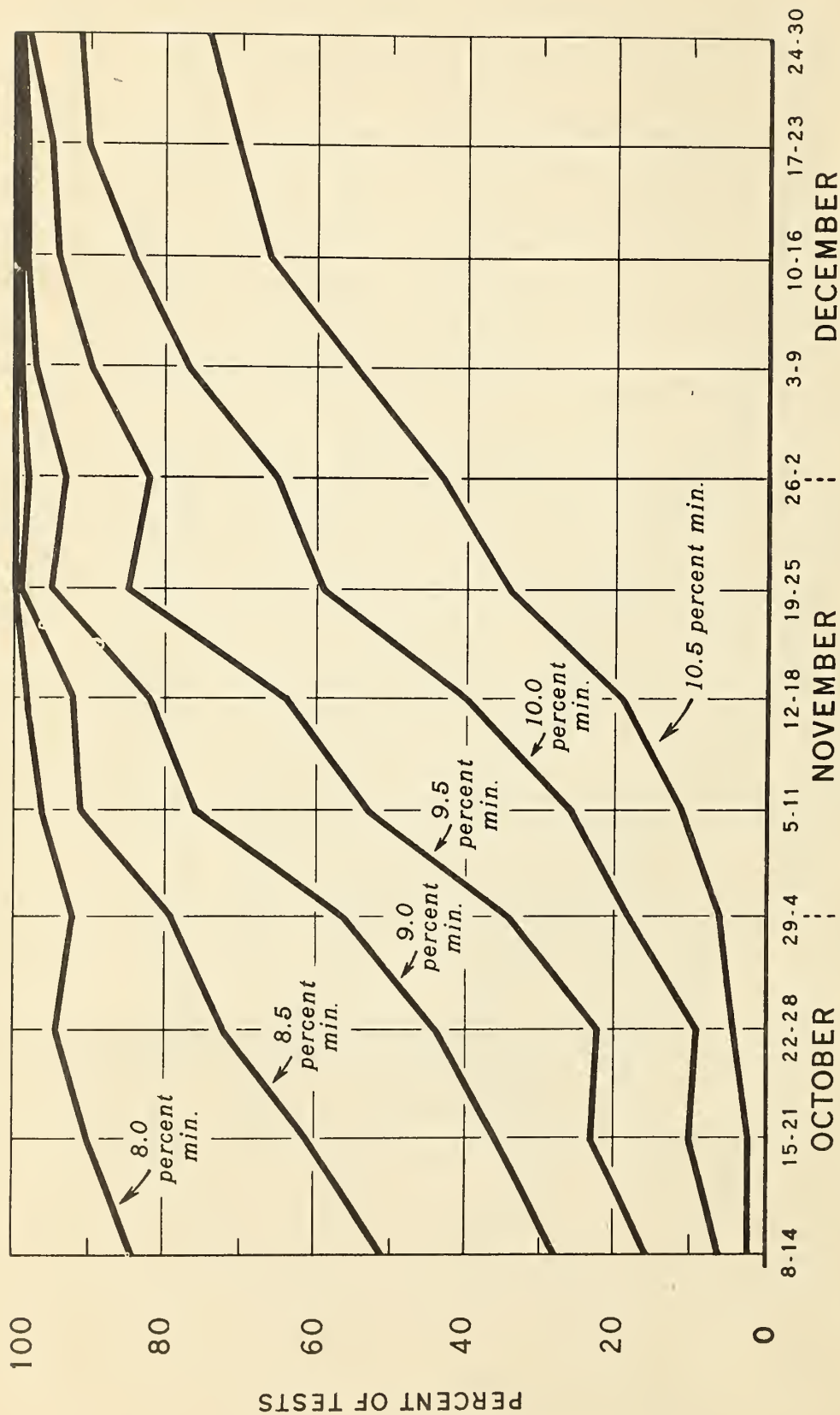
In 1940, (fig. 3) solids were higher than during either of the 2 preceding years. Practically 100 percent of the movement of oranges met an 8 percent minimum for soluble solids from the week of October 8 to 14 through the week ended December 30. During the weekly period October 29 to November 4, 95 percent met a 9 percent minimum; 81 percent met a 9.5 percent minimum; and 49 percent had a content of 10 percent or more solids.



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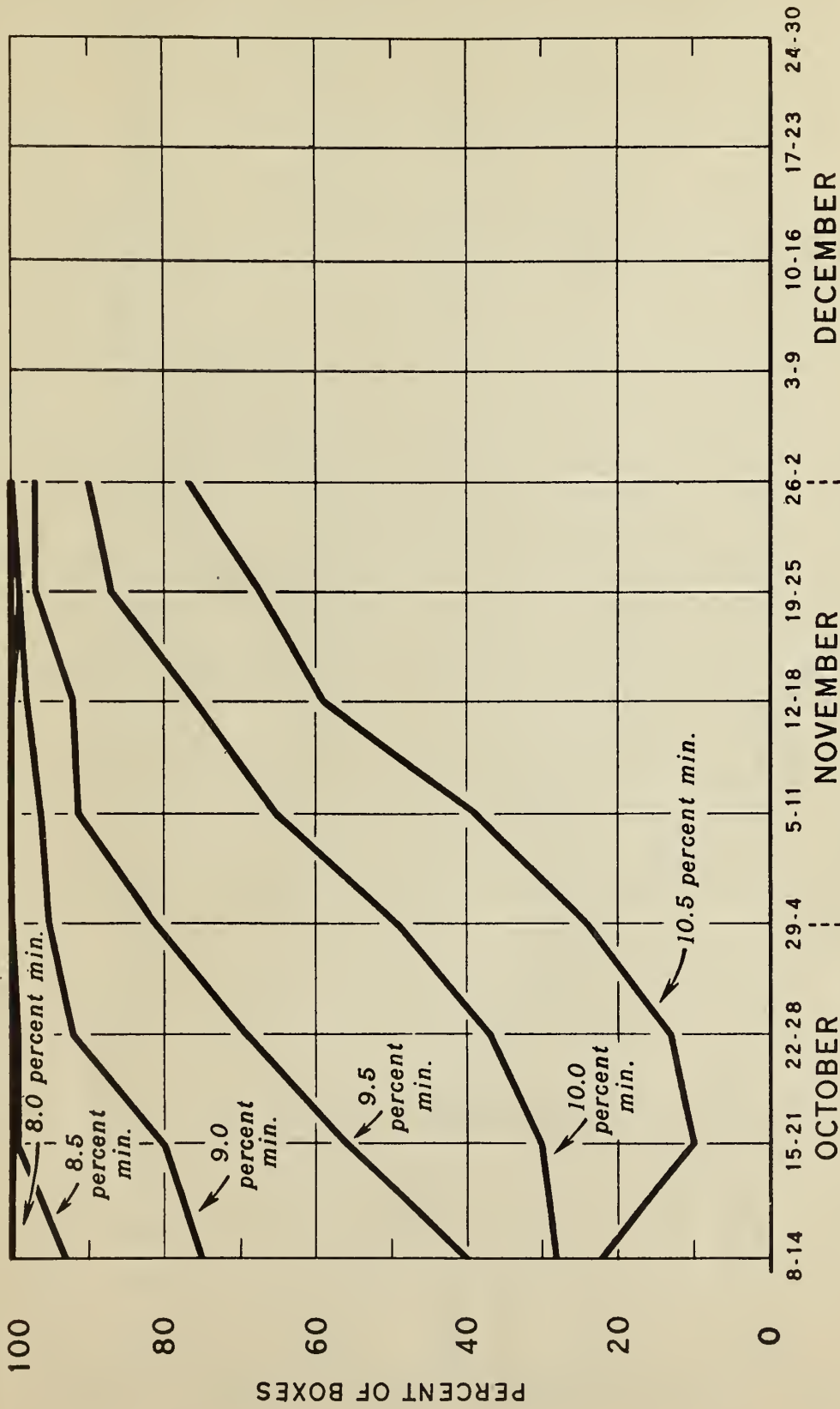
FIGURE 1.- TOTAL SOLUBLE SOLIDS IN FLORIDA ORANGES, 1938: PERCENTAGES OF WEEKLY MOVEMENT THAT MET STATED SPECIFICATIONS.



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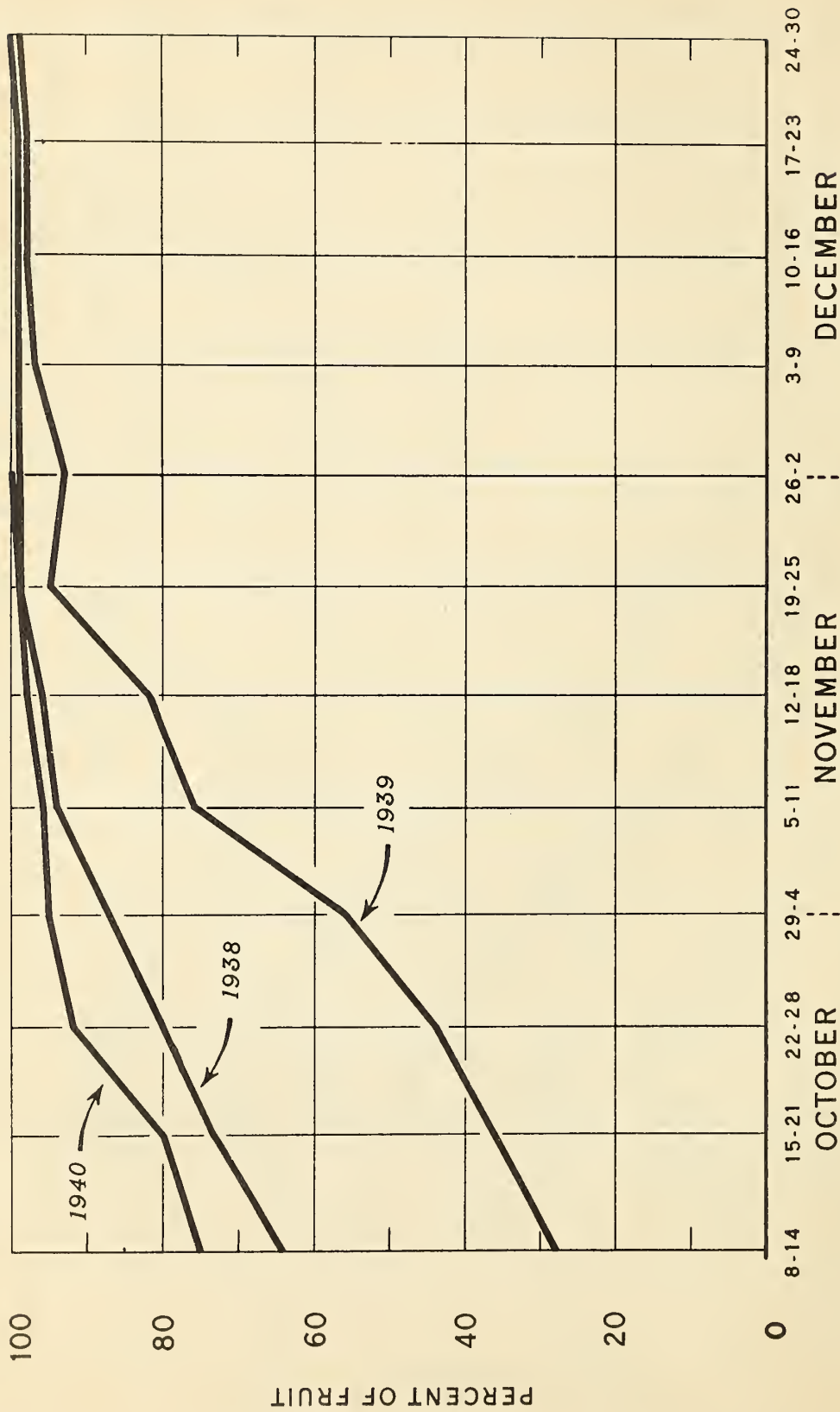
FIGURE 2.- TOTAL SOLUBLE SOLIDS IN FLORIDA ORANGES, 1939: PERCENTAGES OF WEEKLY MOVEMENT THAT MET STATED SPECIFICATIONS.



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FIGURE 3.- TOTAL SOLUBLE SOLIDS IN FLORIDA ORANGES, 1940: PERCENTAGES OF WEEKLY MOVEMENT THAT MET STATED SPECIFICATIONS.



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FIGURE 4.- PERCENTAGES OF WEEKLY MOVEMENT OF FLORIDA ORANGES THAT MET MINIMUM OF 9.0 PERCENT TOTAL SOLUBLE SOLIDS, 1938-40.

Table 1.-Total soluble solids in Florida oranges, 1938, 1939, and 1940. Percentages of weekly movement that met stated specifications

Year	8 Percent or More Solids											
	Oct. : : 8-14	Oct. : : 15-21	Oct. : : 22-28	Nov. : : Nov. 4	Nov. : : 5-11	Nov. : : 12-18	Nov. : : 19-25	Nov. : : Dec. 2	Dec. : : 3-9	Dec. : : 10-16	Dec. : : 17-23	Dec. : : 24-30
	Percent:Percent:	Percent:Percent:	Percent:Percent:	Percent:Percent:	Percent:Percent:	Percent:Percent:	Percent:Percent:	Percent:Percent:	Percent:Percent:	Percent:Percent:	Percent:Percent:	Percent:Percent:
1938	: 98 :	: 99 :	: 99 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :
1939	: 84 :	: 90 :	: 94 :	: 92 :	: 96 :	: 98 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :
1940	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :
Average	: 94 :	: 96 :	: 98 :	: 97 :	: 99 :	: 99 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :
8.5 Percent or More Solids												
1938	: 89 :	: 90 :	: 94 :	: 97 :	: 99 :	: 99 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :
1939	: 51 :	: 61 :	: 72 :	: 79 :	: 91 :	: 92 :	: 99 :	: 98 :	: 99 :	: 99 :	: 99 :	: 100 :
1940	: 93 :	: 99 :	: 99 :	: 100 :	: 100 :	: 100 :	: 99 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :
Average	: 78 :	: 83 :	: 88 :	: 92 :	: 97 :	: 97 :	: 99 :	: 99 :	: 99 :	: 99 :	: 99 :	: 100 :
9 Percent or More Solids												
1938	: 64 :	: 73 :	: 80 :	: 87 :	: 94 :	: 96 :	: 99 :	: 99 :	: 99 :	: 99 :	: 99 :	: 100 :
1939	: 28 :	: 36 :	: 44 :	: 56 :	: 76 :	: 82 :	: 95 :	: 93 :	: 97 :	: 98 :	: 98 :	: 99 :
1940	: 75 :	: 80 :	: 92 :	: 95 :	: 96 :	: 98 :	: 99 :	: 100 :	: 100 :	: 100 :	: 100 :	: 100 :
Average	: 56 :	: 63 :	: 72 :	: 79 :	: 89 :	: 92 :	: 98 :	: 97 :	: 98 :	: 98 :	: 98 :	: 99 :
9.5 Percent or More Solids												
1938	: 36 :	: 50 :	: 59 :	: 71 :	: 84 :	: 90 :	: 95 :	: 96 :	: 95 :	: 98 :	: 98 :	: 98 :
1939	: 16 :	: 23 :	: 22 :	: 34 :	: 53 :	: 64 :	: 85 :	: 82 :	: 90 :	: 94 :	: 95 :	: 98 :
1940	: 40 :	: 56 :	: 69 :	: 81 :	: 91 :	: 92 :	: 97 :	: 97 :	: 100 :	: 100 :	: 100 :	: 100 :
Average	: 31 :	: 43 :	: 50 :	: 62 :	: 76 :	: 82 :	: 92 :	: 92 :	: 92 :	: 96 :	: 96 :	: 98 :
10 Percent or More Solids												
1938	: 15 :	: 25 :	: 36 :	: 46 :	: 61 :	: 74 :	: 80 :	: 87 :	: 89 :	: 92 :	: 93 :	: 93 :
1939	: 6 :	: 10 :	: 9 :	: 18 :	: 26 :	: 40 :	: 59 :	: 65 :	: 77 :	: 84 :	: 90 :	: 91 :
1940	: 28 :	: 30 :	: 37 :	: 49 :	: 65 :	: 76 :	: 87 :	: 90 :	: 100 :	: 100 :	: 100 :	: 100 :
Average	: 16 :	: 22 :	: 27 :	: 38 :	: 51 :	: 63 :	: 75 :	: 81 :	: 83 :	: 88 :	: 91 :	: 92 :
10.5 Percent or More Solids												
1938	: 3 :	: 7 :	: 13 :	: 22 :	: 35 :	: 49 :	: 54 :	: 65 :	: 75 :	: 76 :	: 78 :	: 81 :
1939	: 2 :	: 2 :	: 4 :	: 6 :	: 11 :	: 19 :	: 34 :	: 43 :	: 55 :	: 66 :	: 70 :	: 74 :
1940	: 22 :	: 10 :	: 13 :	: 24 :	: 39 :	: 59 :	: 67 :	: 77 :	: 100 :	: 100 :	: 100 :	: 100 :
Average	: 9 :	: 6 :	: 10 :	: 17 :	: 28 :	: 42 :	: 52 :	: 62 :	: 65 :	: 71 :	: 74 :	: 77 :
Total number of boxes or tests upon which this table is based:												
										1938..... 7,403,048 boxes		
										1939..... 7,027 tests		
										1940..... 3,070,515 boxes		

Figure 4 shows a comparison of percentages of weekly movements which met a 9 percent minimum of total soluble solids during the period from October 8 to December 30, 1938 to 1940. The percentage of fruit that contained 9 percent or more solids was lower in 1939 than in 1938 and 1940, especially during the first part of the season. The percentage of solids in 1939, however, increased rapidly and after the middle of November there was relatively little difference in the percentages of oranges that contained 9 percent or more soluble solids during each of the maturity inspection seasons.

Anhydrous Citric Acid

Table 2 shows the percentages of oranges that met various minimum amounts of anhydrous citric acid during weekly periods in each of the maturity inspection seasons of 1938, 1939, and 1940.

In 1938, 96.6 percent or more of the fruit met a minimum specification of seven-tenths of 1 percent citric acid throughout the season. Practically 100 percent met a minimum of six-tenths of 1 percent.

In 1939, of the oranges moved during the week of October 8 to 14, 77 percent met a minimum acid requirement of seven-tenths of 1 percent. During the following week 80 percent of the fruit met this specification for acid. During each of the following weeks there was a progressive increase in the percentage of fruit that had an acid content of seven-tenths of 1 percent or more. Undoubtedly the progressive increase in the percentages of oranges that met the minimum specifications was due to the increase in movement of mid-season fruit of higher acidity. At least 96 percent of the movement met a minimum of six-tenths of 1 percent acid throughout the maturity inspection season.

In 1940, after the middle of October, nearly all oranges met a minimum acid content of seven-tenths of 1 percent.

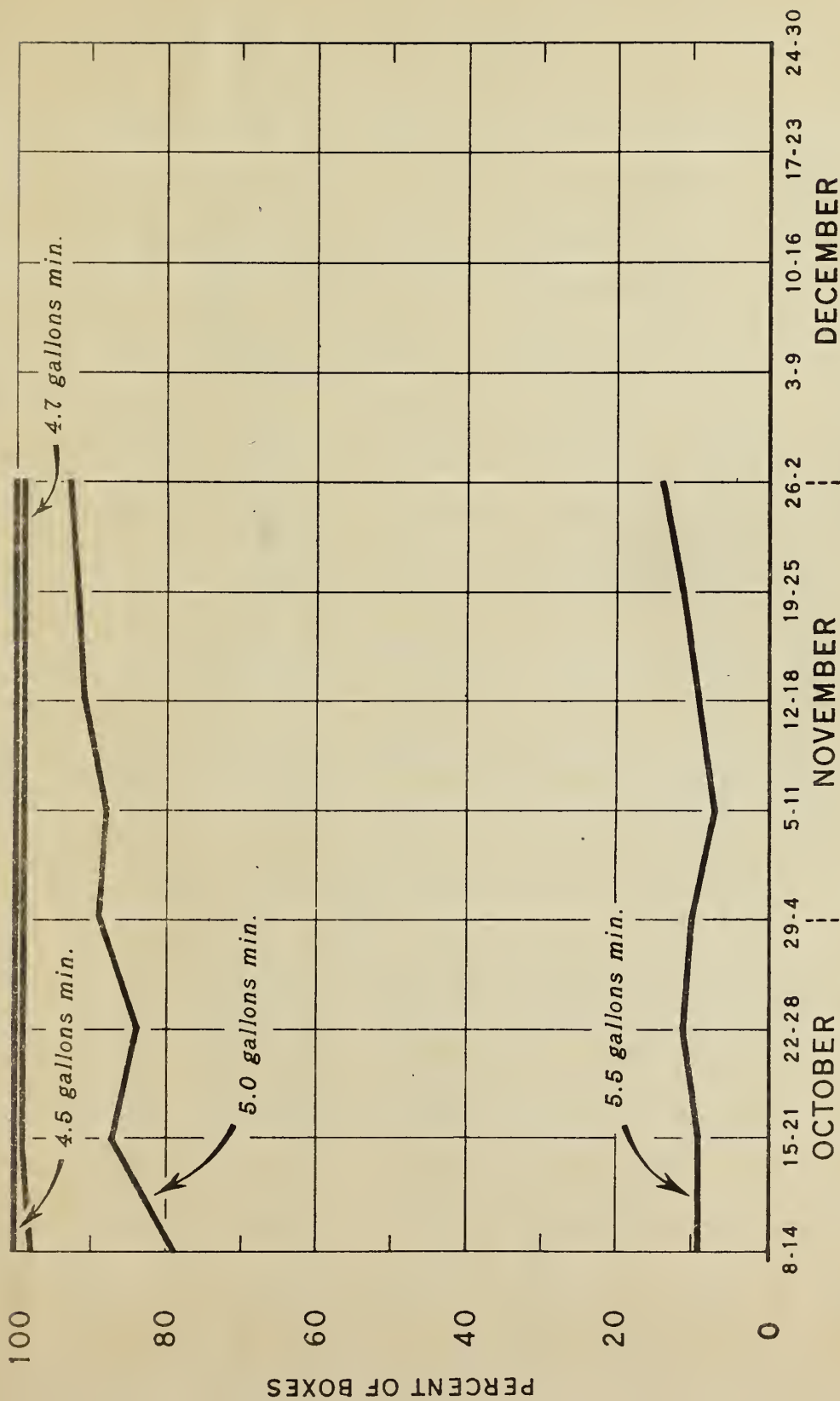
Volume of Juice

Figures 5, 6, and 7 show the percentages of oranges that contained various minimum amounts of juice per standard packed 1-3/5 bushel box, by weekly periods from October 8 through December 2 during each of the years 1938, 1939, and 1940. A comparison in tabular form is also shown in table 3 on page 15.

The percentages shown in these charts are averages of composite tests of all sizes of fruit.

In each of the years 1938, 1939, and 1940, during the period from October 15 to December 2, 98 percent or more of the oranges tested contained not less than 4.5 gallons of juice per box.

A comparison of figures 5, 6, and 7 shows that during the seasons of 1938, 1939, and 1940, the percentages of oranges that contained minimums of 4.5 and 4.7 gallons did not vary to an appreciable extent after the week of October 8 to 14. Previous to that period in 1940 (fig. 7), the percentages of oranges which met specified minimums were rather irregular compared with those for the remainder of the season and with those of the 1938 and 1939 seasons. Possibly this irregularity may be due to the relatively small quantity of fruit that was moved during the period.

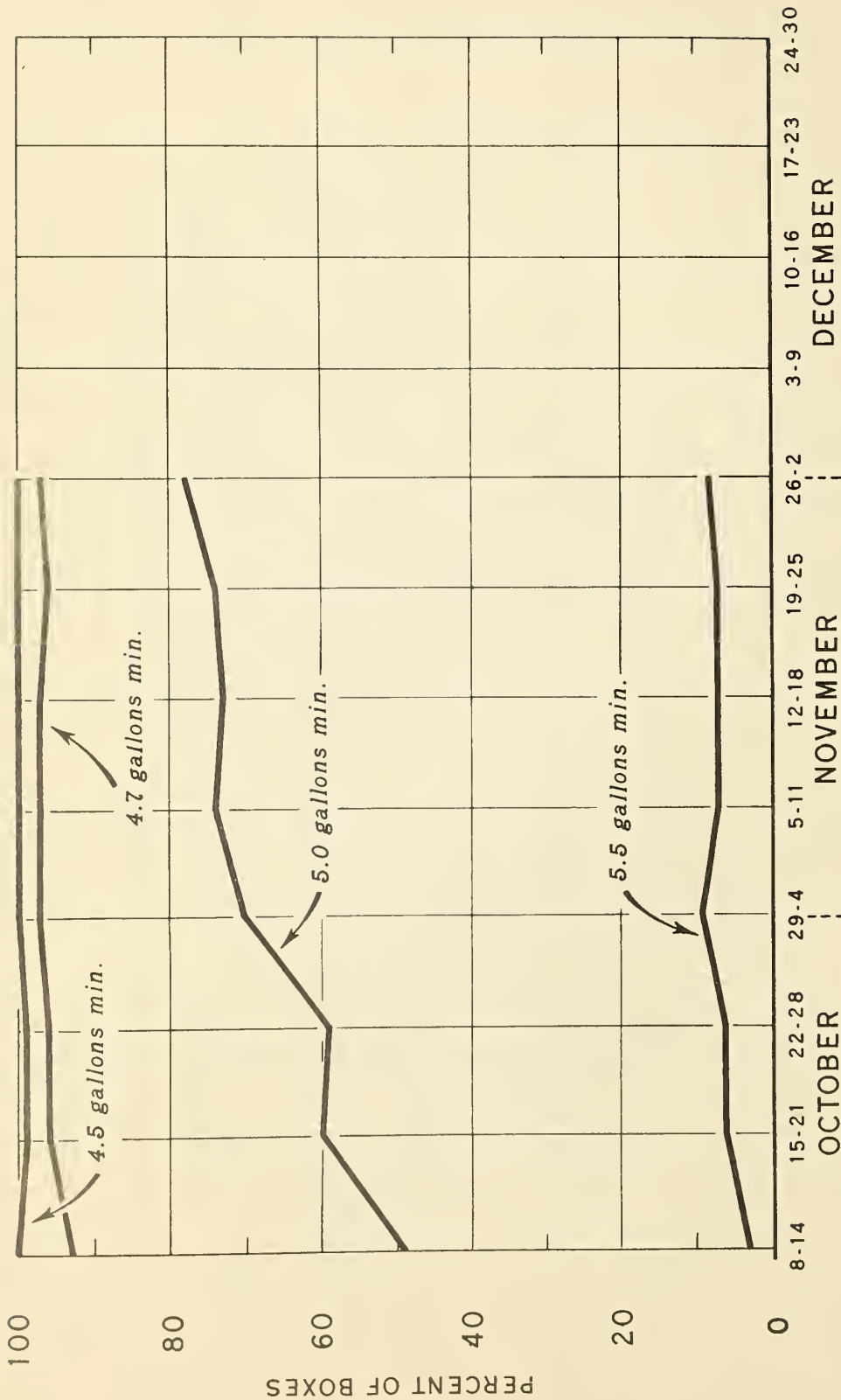


DATA REPRESENT STATE AVERAGES OF COMPOSITE TESTS OF ALL SIZES OF FRUIT.

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FIGURE 5.- VOLUME OF JUICE IN FLORIDA ORANGES, 1938: PERCENTAGES OF WEEKLY MOVEMENT THAT MET STATED SPECIFICATIONS FOR GALLONS OF JUICE PER STANDARD PACKED BOX OF 1-3/5 BUSHELS.

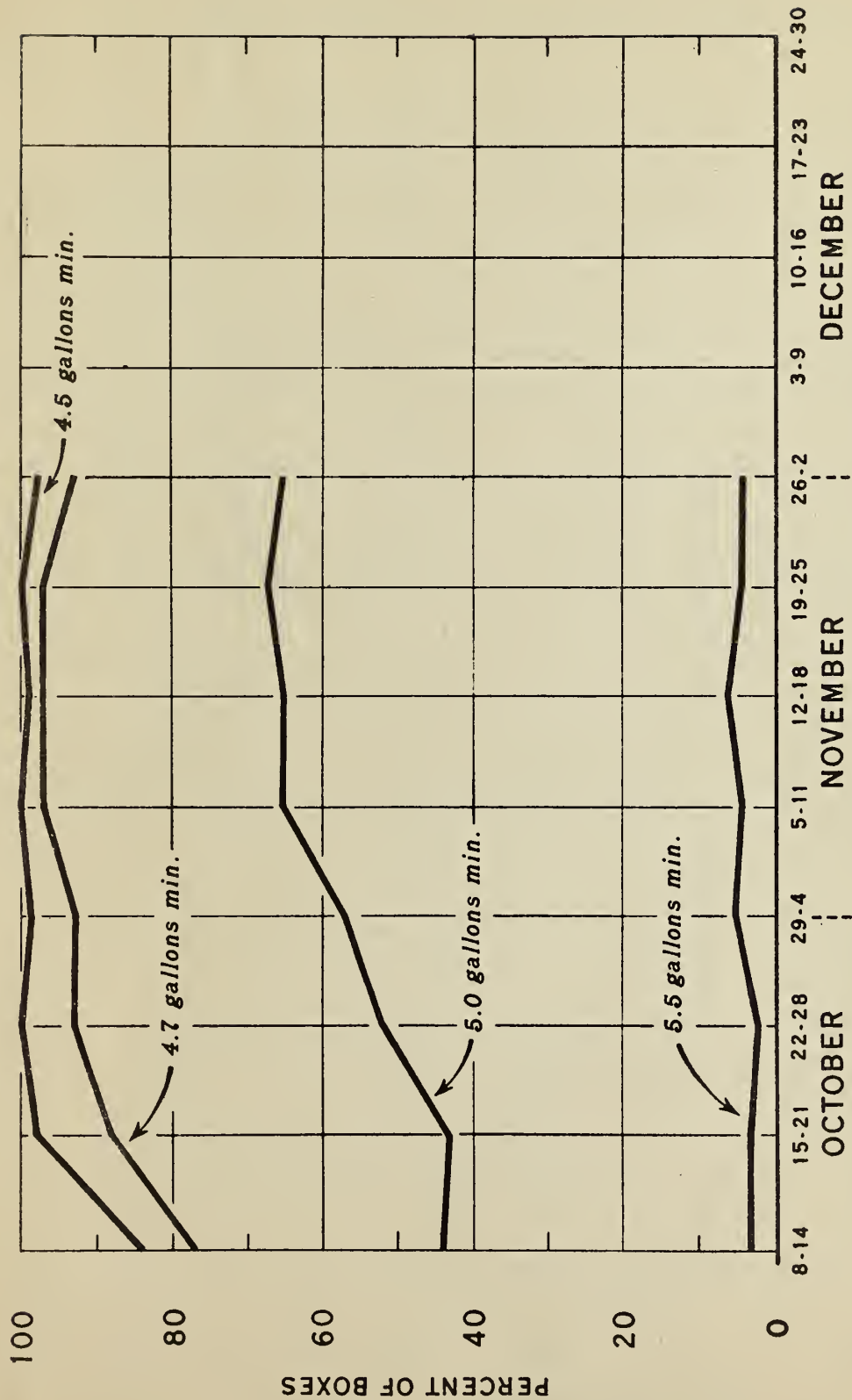


DATA REPRESENT STATE AVERAGES OF COMPOSITE TESTS OF ALL SIZES OF FRUIT.

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FIGURE 6.- VOLUME OF JUICE IN FLORIDA ORANGES, 1939: PERCENTAGES OF WEEKLY MOVEMENT THAT MET STATED SPECIFICATIONS FOR GALLONS OF JUICE PER STANDARD PACKED BOX OF 1-3/5 BUSHEL.

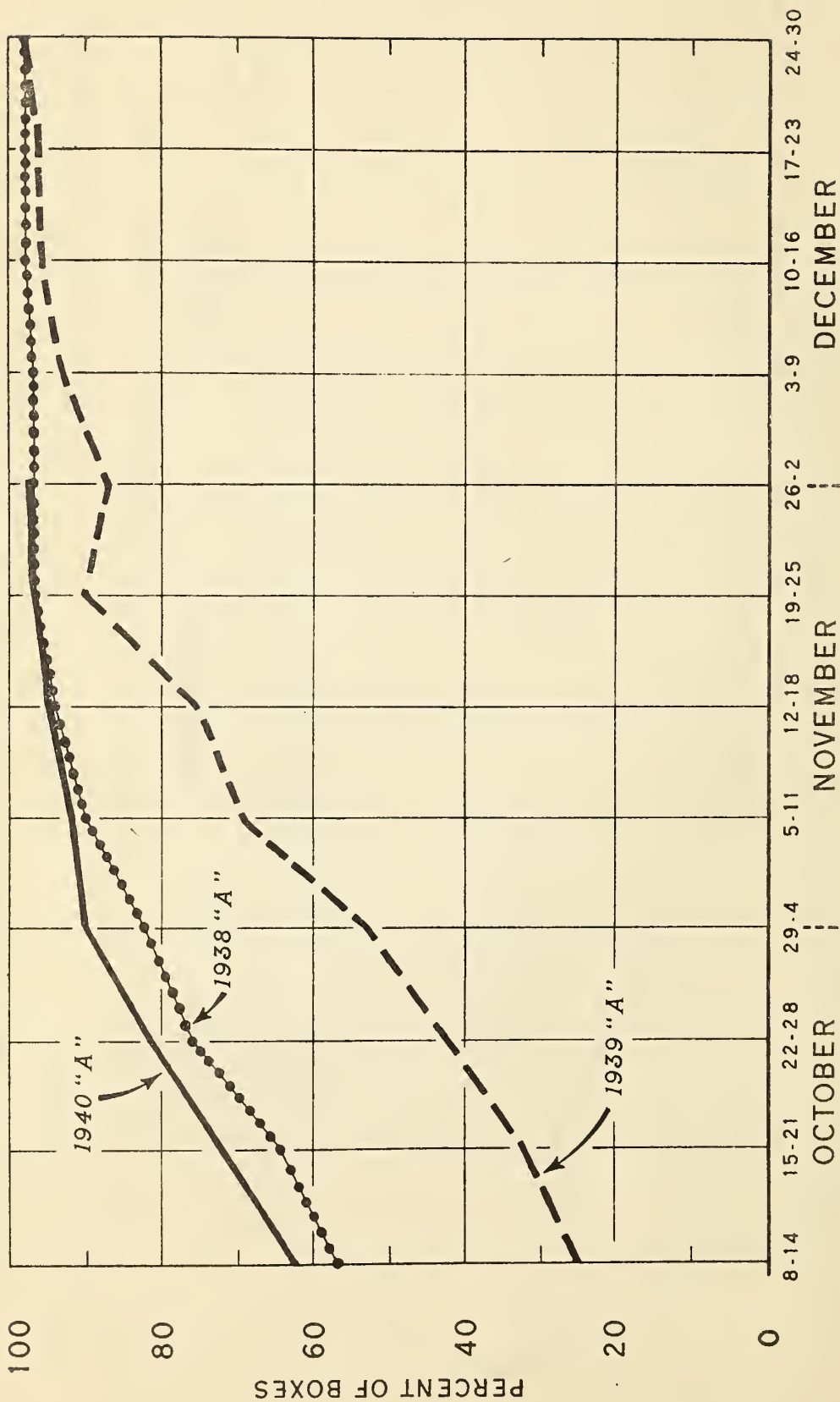


DATA REPRESENT STATE AVERAGES OF COMPOSITE TESTS OF ALL SIZES OF FRUIT.

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FIGURE 7.- VOLUME OF JUICE IN FLORIDA ORANGES, 1940: PERCENTAGES OF WEEKLY MOVEMENT THAT MET STATED SPECIFICATIONS FOR GALLONS OF JUICE PER STANDARD PACKED BOX OF 1-3/5 BUSHELS.



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FIGURE 8.- PERCENTAGES OF WEEKLY MOVEMENT THAT MET THE "A" SPECIFICATION IN 1938, 1939, AND 1940.

It will be noted that during the 1938 season the percentage of oranges that contained 5 gallons or more of juice was considerably higher than that during the 1939 and 1940 seasons.

Percentages of Oranges that Met the "A" Specification

Figure 8 shows the percentages of oranges that met the "A" specification during weekly periods in 1938, 1939, and 1940. The percentages also are shown in table 4 on page 16.

During 1939 the percentages that met the "A" specification were much lower than those in 1938 and 1940. This was because early in the fall of 1939, oranges were lower in solids than in either of the other 2 years. Beginning with the week of November 19 to 25, there was only a relatively small difference in the percentage of fruit meeting the "A" specification for each of the 3 years.

Percentages That Failed to Meet the "A" Specification

Table 5 shows a comparison of the quantities and the percentages of oranges that failed to meet the "A" specification during the seasons 1938-39, 1939-40, and 1940-41. The percentages of fruit that failed to meet this specification are based upon the total movement of oranges throughout the entire season.

In table 6 the percentages that failed to meet "A" specification are based upon shipments that moved from October 1 to December 30.

It will be noted that a much larger percentage of fruit failed to meet the "A" specification in 1939 than in either the 1938 or the 1940 season. This failure was due mainly to the lower solid content in oranges during the early part of the 1939 season.

Table 2.-Anhydrous citric acid in Florida oranges, 1938, 1939, and 1940. Percentages of Weekly movement that met stated specifications

0.7 Percent or More Citric Acid													
Year	: Oct. : Oct. : Oct.29: Nov. : Nov. : Nov. : Nov.20-: Dec. : Dec. : Dec. : Dec. : Dec. : Dec.												
	: 8-14 : 15-21 : 22-28 : Nov. 4: 5-11 : 12-18 : 19-25 : Dec. 2 : 3-9 : 10-16 : 17-23 : 24-30												
	: Percent:Percent:Percent:Percent:Percent:Percent:Percent:Percent:Percent:Percent:Percent:Percent:Percent												
1938	: 86.6 : 98.3 : 97.6 : 97.5 : 97.5 : 97.9 : 98.4 : 99.3 : 98.9 : 99.9 : 99.5 : 99.7												
1939	: 77 : 80 : 83 : 87 : 89 : 90 : 93 : 95 : 98 : 99 : 99 : 99.8												
1940	: 87 : 94 : 99.3 : 100 : 100 : 99.9 : 99.4 : 99.3 : --- : --- : --- : ---												
Average	: 84 : 91 : 93 : 95 : 95 : 96 : 97 : 98 : 98 : 99 : 99 : 100												
0.6 Percent or More Citric Acid													
1938	: 99.7 : 100 : 99.7 : 99.4 : 99.8 : 99.7 : 99.6 : 99.9 : 99.9 : 99.9 : 99.9 : 100												
1939	: 96 : 98.5 : 98.4 : 96 : 97 : 97 : 99 : 99 : 99 : 99.5 : 100 : 100												
1940	: 89 : 95 : 99.4 : 100 : 100 : 99.9 : 100 : 99.9 : --- : --- : --- : ---												
Average	: 95 : 99 : 99 : 98 : 99 : 99 : 99 : 100 : 100 : 100 : 100 : 100												
0.5 Percent or More Citric Acid													
1938	: 100 : 100 : 99.9 : 100 : 100 : 99.9 : 99.9 : 100 : 100 : 100 : 100 : 100												
1939	: 98 : 100 : 100 : 99.8 : 99.8 : 99.9 : 99.8 : 100 : 100 : 100 : 100 : 100												
1940	: 89 : 95 : 99.4 : 100 : 100 : 100 : 100 : 100 : --- : --- : --- : ---												
Average	: 96 : 98 : 100 : 100 : 100 : 100 : 100 : 100 : 100 : 100 : 100 : 100												
0.4 Percent or More Citric Acid													
1938	: 100 : 100 : 99.9 : 100 : 100 : 99.9 : 99.9 : 100 : 100 : 100 : 100 : 100												
1939	: 99.3 : 100 : 100 : 100 : 100 : 100 : 100 : 100 : 100 : 100 : 100 : 100												
1940	: 99 : 98 : 99.5 : 100 : 100 : 100 : 100 : 100 : --- : --- : --- : ---												
Average	: 99 : 99 : 100 : 100 : 100 : 100 : 100 : 100 : 100 : 100 : 100 : 100												

Total number of boxes or tests upon which this table is based: 1938..... 7,403,048 boxes
 1939..... 7,027 tests
 1940..... 3,070,515 boxes

Table 3.-Volume of juice in Florida oranges, 1938, 1939, and 1940. Percentages of weekly movement that met stated specifications for gallons of juice per standard packed box of 1-3/5 bushels (Data represents State averages of composite tests of all sizes of fruit)

Year	4.5 Gallons or More											
	Oct. 8-14	Oct. 15-21	Oct. 22-28	Oct. 29 : Nov. 4	Nov. 5-11	Nov. 12-18	Nov. 19-25	Nov. 26 : Dec. 2				
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
1938	100	100	100	100	100	100	100	100	100	100	100	100
1939	100	99	99	100	100	100	100	100	100	100	100	100
1940	84	98	100	99	100	99	99	100	100	100	98	98
Average	95	99	100	100	100	100	100	100	100	100	99	99

4.7 Gallons or More											
1938	98	99	99	99	99	99	99	99	99	99	99
1939	93	96	96	97	97	97	97	96	96	97	97
1940	77	88	93	93	97	97	97	97	97	97	93
Average	89	94	96	96	98	98	98	97	97	97	96

5 Gallons or More											
1938	79	87	84	89	89	91	92	92	93	93	93
1939	49	60	59	70	74	73	74	74	78	78	78
1940	44	43	52	57	65	65	67	67	65	65	65
Average	57	63	65	72	76	76	78	78	79	79	79

5.5 Gallons or More											
1938	9	9	11	10	7	9	11	11	14	14	14
1939	3	6	6	9	7	7	7	7	8	8	8
1940	3	3	2	5	4	6	4	4	4	4	4
Average	5	6	6	8	6	7	7	7	10	10	10

Total number of boxes upon which this table is based: 1938..... 3,534,054 boxes
 1939..... 3,855,272 "
 1940..... 3,039,656 "

Table 4.-Percentages of weekly movement of Florida oranges that met the "A" specification ^{1/} in 1938, 1939, and 1940

Year	Oct. : 8-14	Oct. : 15-21	Oct. : 22-28	Oct. : 29-Nov. 4	Oct. : 5-11	Nov. : 12-18	Nov. : 19-25	Nov. : 26-Dec. 2	Dec. : 3-9	Dec. : 10-16	Dec. : 17-23	Dec. : 24-30
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
1938	57	64	76	82	90	94	97	97	97	98	98	98
1939	25	32	42	53	69	75	90	87	93	96	96	98
1940	62	72	81	90	92	95	97	97	---	---	---	---
Average	48	56	66	75	84	88	95	94	95	97	97	98

^{1/} See "A" specification, pages 18 and 19.

Total number of boxes or tests on which this table is based: 1938..... 7,403,048 boxes
1939..... 7,027 tests
1940..... 3,070,515 boxes

Table 5.-Total movement through the entire seasons, 1938-39, 1939-40, and 1940-41, and number of carlot equivalents that failed to meet the "A" specification during the period October 8 through December 30

Year	Total movement :(Carlot Equivalents): through entire season	Carlot equivalents that failed to meet "A" specification Oct. 8-Dec. 30	Percentage of total movement that failed to meet specification
	Number	Number	Percent
1938-39	69,317	1,783	2.6
1939-40	47,386	4,532	9.6
1940-41	1/ 56,513	853	1.5
Average:	57,739	2,389	4.1

1/ Total shipments to June 30.

Table 6.-Total movement and number of carlot equivalents that failed to meet the "A" specification, October 1 - December 30, 1938-40

Year	Total movement :(Carlot Equivalents): from Oct. 1-Dec. 30	Carlot equivalents that failed to meet "A" specification	Percentage that failed to meet specifi- cation
	Number	Number	Percent
1938	19,307	1,783	9.2
1939	19,741	4,532	23.0
1940	16,025	853	4.6
Average:	18,358	2,389	13.0

Total number of boxes or tests on which this table is based:

1938 7,403,048 boxes
1939 7,027 tests
1940 3,070,515 boxes

"A" Specification 1/

This specification requires a minimum of not less than 9 percent total soluble solids, five-tenths of 1 percent anhydrous citric acid, and a graduated ratio as shown below:

Total soluble solids	:	Maximum anhydrous citric acid	:	Minimum ratio of total soluble solids to anhydrous citric acid
Percent	:	Percent	:	
9.0	:	.947	:	9.50 to 1
9.1	:	.963	:	9.45 " "
9.2	:	.979	:	9.40 " "
9.3	:	.995	:	9.35 " "
9.4	:	1.011	:	9.30 " "
9.5	:	1.027	:	9.25 " "
9.6	:	1.043	:	9.20 " "
9.7	:	1.060	:	9.15 " "
9.8	:	1.077	:	9.10 " "
9.9	:	1.094	:	9.05 " "
10.0	:	1.111	:	9.00 " "
10.1	:	1.128	:	8.95 " "
10.2	:	1.146	:	8.90 " "
10.3	:	1.164	:	8.85 " "
10.4	:	1.182	:	8.80 " "
10.5	:	1.200	:	8.75 " "
10.6	:	1.218	:	8.70 " "
10.7	:	1.237	:	8.65 " "
10.8	:	1.256	:	8.60 " "
10.9	:	1.275	:	8.55 " "
11.0	:	1.294	:	8.50 " "
11.1	:	1.306	:	8.50 " "
11.2	:	1.318	:	8.50 " "
11.3	:	1.329	:	8.50 " "
11.4	:	1.341	:	8.50 " "
11.5	:	1.353	:	8.50 " "
11.6	:	1.365	:	8.50 " "
11.7	:	1.376	:	8.50 " "
11.8	:	1.388	:	8.50 " "
11.9	:	1.400	:	8.50 " "
12.0	:	1.412	:	8.50 " "
12.1	:	1.424	:	8.50 " "
12.2	:	1.435	:	8.50 " "
12.3	:	1.447	:	8.50 " "
12.4	:	1.459	:	8.50 " "
12.5	:	1.471	:	8.50 " "
12.6	:	1.482	:	8.50 " "
12.7	:	1.494	:	8.50 " "
12.8	:	1.506	:	8.50 " "
12.9	:	1.517	:	8.50 " "

1/ This specification was used as a basis for the requirements of "A" Quality Juice" as described in Amendment No. 1 "U. S. Standard for Internal Quality of Common Sweet Oranges," issued by the Agricultural Marketing Service, November 8, 1941.

"A" Specification - continued

Total soluble solids		Maximum anhydrous citric acid		Minimum ratio of total soluble solids to anhydrous citric acid	
Percent	:	Percent	:		
13.0	:	1.53	:	8.50	to 1
13.1	:	1.541	:	8.50	" "
13.2	:	1.553	:	8.50	" "
13.3	:	1.565	:	8.50	" "
13.4	:	1.576	:	8.50	" "
13.5	:	1.588	:	8.50	" "
13.6	:	1.600	:	8.50	" "
13.7	:	1.612	:	8.50	" "
13.8	:	1.624	:	8.50	" "
13.9	:	1.635	:	8.50	" "
14.0	:	1.647	:	8.50	" "
14.1	:	1.659	:	8.50	" "
14.2	:	1.671	:	8.50	" "
14.3	:	1.682	:	8.50	" "
14.4	:	1.694	:	8.50	" "
14.5	:	1.705	:	8.50	" "
14.6	:	1.718	:	8.50	" "
14.7	:	1.729	:	8.50	" "
14.8	:	1.741	:	8.50	" "
14.9	:	1.753	:	8.50	" "
15.0	:	1.765	:	8.50	" "
15.1	:	1.776	:	8.50	" "
15.2	:	1.788	:	8.50	" "
15.3	:	1.80	:	8.50	" "
15.4	:	1.812	:	8.50	" "
15.5	:	1.824	:	8.50	" "
More than 15.5	:		:	8.50	" "

Summary

1. This report presents facts that should aid in an intelligent approach to the establishment of standards for internal quality of oranges.

The study is based upon the analyses of maturity inspection certificates for Florida oranges, which were issued during the 1938, 1939, and 1940 seasons, and which covered more than 10,000,000 boxes of oranges. The results obtained appear to be in substantial agreement with published studies and with general expert opinions regarding the behavior of internal characteristics of oranges.

2. Ninety-eight percent or more of the oranges contained at least 4.5 gallons of juice per standard packed box of 1-3/5 bushels, from the middle of October throughout the maturity inspection seasons of 1938, 1939, and 1940.

3. The quantity of fruit that met various minimum percentages of total soluble solids increased in fairly uniform progression throughout the maturity inspection seasons. After the first of November, a large majority of fruit contained more than 9 percent solids.

4. For the three seasons, between October 22 and December 30, practically 100 percent of the fruit contained not less than five-tenths of 1 percent citric acid and 83 percent or more of the fruit contained not less than seven-tenths of 1 percent citric acid.

5. The quantity of oranges that met the "A" specification increased as the season progressed. For example, 90, 69, and 92 percent, respectively, of the fruit met the "A" specification during the week of November 5 to 11 in 1938, 1939, and 1940, whereas 98 and 96 percent respectively, met the specification during the week of December 10 to 16 in each of the seasons 1938 and 1939.